

## Claims

1. A method for producing a support for determining analytes, comprising the steps of
  - 5 (a) providing a support body comprising at least one channel,
  - (b) passing liquid with building blocks for synthesizing polymeric receptors through the channel or channels of the support body,
  - 10 (c) site- or/and time-specifically immobilizing the receptor building blocks in each case on predetermined positions in the channel or channels and
  - 15 (d) repeating steps (b) and (c) until the required receptors have been synthesized in each case on the predetermined positions.
2. The method as claimed in claim 1, characterized in that a support which comprises defined area regions with, in each case, identical receptor species is produced.
- 20 3. The method as claimed in claim 1 or 2, characterized in that the channels are arranged on at least one support surface.
- 25 4. The method as claimed in any of claims 1 to 3, characterized in that the support comprises a large number of channels which are preferably arranged parallel to one another.
- 30 5. The method as claimed in any of claims 1 to 4, characterized in that the receptors are selected from nucleic acids and nucleic acid analogs.
- 35 6. The method as claimed in claim 5, characterized in that the receptor building blocks are selected from nucleotides, oligonucleotides, nucleotide

analog and oligonucleotide analogs.

- 5 7. The method as claimed in any of claims 1 to 4, characterized in that the receptors are selected from polypeptides.
- 10 8. The method as claimed in claim 7, characterized in that the receptor building blocks are selected from amino acids and peptides.
- 15 9. The method as claimed in any of claims 1 to 7, characterized in that the site- or/and time-specific immobilization of the receptor building blocks takes place by illumination.
- 20 10. The method as claimed in claim 9, characterized in that the illumination takes place via a programmable light source matrix.
- 25 11. The method as claimed in any of claims 1 to 8, characterized in that the site- or/and time-specific immobilization of the receptor building blocks takes place by wetting with an activating fluid with controllable selection of the activated positions.
- 30 12. The method as claimed in any of claims 1 to 11, characterized in that the pattern of polymeric receptors is fixed by computer programming.
- 35 13. The method as claimed in any of claims 1 to 12, characterized in that the support is used for determining analytes in a sample.
14. A method for integrated synthesis and analyte determination on a support, comprising the steps of:  
(a) providing a support body,

- (b) passing a liquid with, present therein, receptors or building blocks for synthesizing polymeric receptors over the support,
  - 5 (c) site- or/and time-specifically immobilizing the receptors or receptor building blocks in each case on predetermined positions on the support,
  - (d) where appropriate repeating steps (b) and (c) until the required receptors have been  
10 synthesized in each case on the predetermined positions on the support,
  - (e) bringing the support into contact with a sample containing analytes and
  - 15 (f) determining the analytes via their binding to the receptors immobilized on the support.
15. The method as claimed in claim 14, characterized in that the synthesis and analyte determination is carried out in an integrated apparatus, with the  
20 synthesis or/and the analyte determination process being monitored and controlled in any number of positions on the support.
16. The method as claimed in claim 15, characterized  
25 in that an integrated apparatus comprising a programmable light source matrix, a detector matrix, a support arranged between light source matrix and detector matrix, and means for supplying fluids into the support and for  
30 discharging fluids from the support is used.
17. The method as claimed in any of claims 14 to 16, characterized in that the analyte is removed again from the support after the determination.  
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18. The method as claimed in any of claims 14 to 17, characterized in that a plurality of synthesis/analyte determination cycles is carried out, with the receptors for a subsequent cycle being

synthesized on the basis of the information from a preceding cycle.

- 5 19. The method as claimed in claim 18, characterized in that an extension of the receptors from the preceding cycle takes place for the subsequent cycle.
- 10 20. The method as claimed in claim 18, characterized in that a new support with receptors which are modified compared with the preceding cycle is synthesized for the subsequent cycle.
- 15 21. The method as claimed in claim 20, characterized in that the modification of the receptors comprises a change in the sequence or/and an exclusion of negative receptors from the preceding cycle.
- 20 22. The method as claimed in any of claims 14 to 21, characterized in that a planar support is used.
- 25 23. The method as claimed in any of claims 14 to 21, characterized in that a support with a large number of channels is used.
- 30 24. The method as claimed in any of claims 14 to 23, characterized in that a plurality of supports is used for a synthesis/analyte determination cycle.
- 35 25. The method as claimed in claim 24, characterized in that the plurality of supports is synthesized and analyzed in different detection apparatuses between which there are information technology links but which may be spatially separate from one another.
26. A support for determining analytes comprising a large number of channels, in particular capillary

channels, a large number of different receptors being immobilized in the channels.

- 5 27. A support as claimed in claim 26, characterized in that it is optically transparent at least in the region of the reaction regions.
- 10 28. A reagent kit comprising a support as claimed in claim 26 or 27 and building blocks for synthesizing polymeric receptors on the support.
- 15 29. An apparatus for integrated synthesis and analyte determination on a support comprising a programmable light source matrix, a detector matrix, a support arranged between light source matrix and detector matrix, and means for supplying fluids into the support and for discharging fluids from the support.
- 20 30. An apparatus as claimed in claim 29 additionally comprising means for deprotection of reaction components on the support.
- 25 31. An apparatus as claimed in claim 29 or 30 additionally comprising electronic control means.
- 30 32. The use of the method as claimed in any of claims 1 to 25, of the support as claimed in claim 26 or 27, of the reagent kit as claimed in claim 28 or of the apparatus as claimed in any of claims 29 to 31 for determining an analyte in a sample.
- 35 33. The use as claimed in claim 32 for the sequencing of nucleic acids.
34. The use as claimed in claim 33 for new sequencing or/and resequencing of complex genetic material such as, for example, individual genomes or

synthetic nucleic acids.

5 35. The use as claimed in claim 32 for obtaining  
diagnostic information for individual patient  
management such as, for example, the individual  
effect of pharmaceuticals.

10 36. The use as claimed in claim 32 for analyzing the  
effect of pharmacological substances.

37. The use as claimed in claim 32 for setting up and  
analyzing substance libraries.

15 38. The use as claimed in claim 32 for comparing  
individuals in a population.